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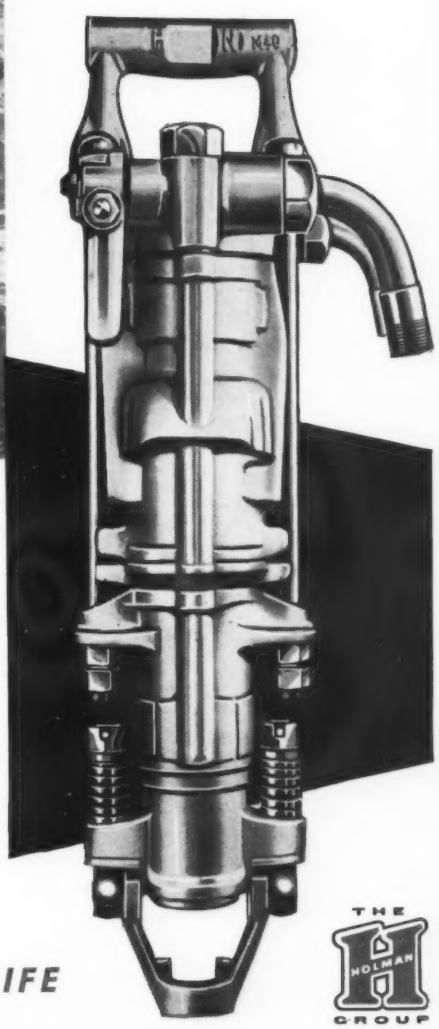

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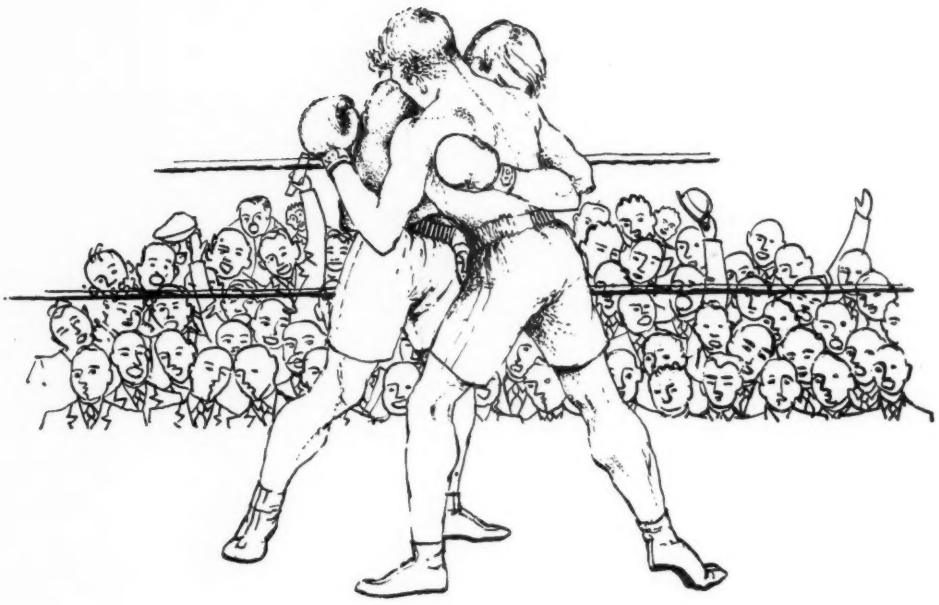

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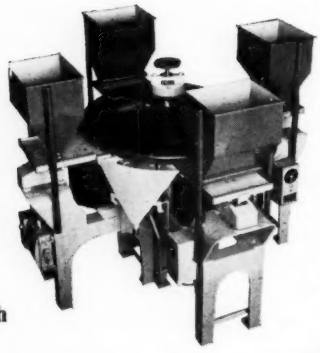

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Aluminium in Abundance

THE sharp falling off in percentage utilization of primary aluminium capacity in the Free World during 1958 has tended to obscure the continued underlying strength of the demand for this metal. Thus, although the early weeks of 1959 found U.S. producers operating at about 80 per cent of capacity and Canada at no more than 68 per cent, total Free World consumption in 1958 had declined by no more than 3 per cent or about 100,000 s.tons. As consumption in the States alone declined by considerably more than this amount, it will be apparent that elsewhere consumption remained at record or near record levels.

The fact is that, like copper, aluminium has been going through a period where the rate of growth in productive capacity has been much more rapid than the rate of growth in consumption. The time lag between the planning and the bringing into production of new capacity is considerable, so that short-term fluctuations in the rate of growth of consumption must be disregarded if an orderly growth in production capacity is to be planned and the consumer is to be spared the embarrassment of shortages consequent upon sudden spurts in consumption such as that of the post-Korean period. The cost of carrying idle capacity may not be inconsiderable, but, as the copper producers have already found, the cost of not having the capacity to meet the demand can be infinitely greater in terms of market dislocation and permanent loss of markets to substitutes. This is undoubtedly one of the lessons which the mining industry has learnt in the present decade and while the long-term trend of demand is so strongly upwards we may expect to see producers of the big tonnage metals planning always to keep something in hand.

Some of us were startled a few weeks ago to read Sir Ronald Prain's forecast that something like £1,000,000,000 would need to be spent on new capital investment in copper mining to keep pace with growing demand in the next ten years. These figures are, however, as nothing compared with the scale of expansion envisaged by the aluminium producers. At the beginning of 1958, Free World capacity was of the order of 3,600,000 s.tons while at the beginning of 1959, this figure had risen to 4,100,000 s.tons. U.S. primary aluminium capacity at the beginning of this year was about 2,200,000 s.tons, and according to present plans is expected to increase by a further 400,000 s.tons in the next few years. Similarly, the completed Kitimat project in British Columbia, the later stages of which are at present being retarded, would—together with the Quebec facilities—give Canada a capacity of 1,000,000 s.tons, that is to say, 30 per cent more than present installed capacity. Thus, if the necessity were to arise there should be little difficulty in North American production alone being increased within the next three years to around 3,500,000 s.tons compared with a total of 2,150,000 which was the actual combined production for the United States and Canada last year.

With reserve capacity of this magnitude in sight and United States' stockpiling obligations rapidly running down, it is not surprising that the past year should have been one of intensive product development and sales promotion for all the big companies.

It has long been apparent that so far as the development of new markets is concerned the aluminium producer's interest lay largely with the big tonnage applications. Of these, the motor industry and certain constructional applications, notably in housing, have been making headway.

In 1948 the average American car carried 12 lb. of aluminium, last year it carried 52 lb. and this year it will carry 59 lb. The forecast is that by 1970 it will be carrying 200 lb., by which time, if we assume only the present annual rate of American car production, this one U.S. industry would be consuming aluminium at a rate at least equal to the whole of Canada's production last year.

Again, experimental houses (mainly of the prefabricated type) have been built in some hundreds in the last year or so with an aluminium content ranging from 1,400 lb. to 3,000 lb. per house compared with an average of less than 100 lb. for the typical American house of traditional construction. Aside from the fact that these houses have been well received by the American public, there is thought to be a great future for them in the undeveloped areas of the world.

Indeed, it may well be in the more backward countries that we shall in the longer term see the most significant increase in the usage of aluminium and of some of the other newer constructional materials, precisely for the reason that areas of the world where there is liable to be a rapid growth in constructional projects over the next ten or twenty years may well be areas where demand would be concentrated on the newer materials, by-passing altogether the phase of building with the traditional materials which made Britain a built-up area nearly 50 years ago.

Even if this prospect does not materialize rapidly, most of the Western countries outside the United States have a long way to go before catching up with the present U.S. annual *per capita* consumption of about 20 lb., which compares with about 15 lb. in Switzerland, 13 lb. in Britain, and so on, down to about 5 lb. *per capita* in Italy. It has been fairly common experience in recent years to find that American calculations of European metal consumption have been underestimated, and it would be no surprise to find the larger part of the future increase in Free World aluminium consumption coming from outside the States.

For many years past, Aluminium Ltd. has been alone among the big North American producers in having a large world-wide market, and the recent struggle between Alcoa and Reynolds, the two biggest producers in the United States, for the control of British Aluminium, is doubtless indicative of the U.S. producers need to break into foreign markets, in order to accelerate the absorption of excess capacity.

As the U.S. producers acquire an increasing share of world markets, it will be interesting to see how far they will be able to preserve the pattern of strong vertical integration, which has characterized their domestic operations. Aluminium Ltd. has always sold a much greater proportion of its output to non-integrated fabricators than have the U.S. producers; and, indeed, the world aluminium market has been made, to a large extent, by the Canadian producer. It has yet to be seen what changes may develop in world pricing and marketing mechanisms as greater competition develops in the non-American markets.

NUCLEAR MATERIALS IN CEYLON

There is a good possibility of developing uranium mining in Ceylon, according to Dr. Georges Bigotte, a member of a six-man team from the International Atomic Energy Agency, now in Ceylon Dr. Bigotte said that Ceylon's geological structure was favourable to the discovery of uranium. Madagascar had almost the same geological features as Ceylon, and now Madagascar was producing uranium from uranothorianite. Uranium is expected to be found in Central and Southern Ceylon. The rocks here are pre-Cambrian, like those found in Madagascar.

Dr. Bigotte said that if the Government of Ceylon agreed, and their agency, too, agreed with the idea, two experts could be sent from the agency to develop the uranium project in Ceylon. Members of the team, in addition to Dr. Bigotte, are Dr. Hugh Belcher, U.K.; Mr. Maheswar Dayal, India; Professor Oleg Katzatschkovsky, U.S.S.R.; Dr. Harold Smith, International Atomic Energy Agency scientific staff; and Dr. Wladimir Grigorioff.

INDIA'S ATOMIC ENERGY PROGRAMME

Dr. J. H. Bhaba, Director of the Tata Institute of Fundamental Research, Bombay, has recently told the Indian Institute of Science at Bangalore, that if India was to benefit from the advantages of nuclear power ten to fifteen years hence, an investment in 1,000,000 kW. of nuclear power had to be made within the next seven years. With the vast reserves of thorium available in India, he said, additional investment in nuclear power in the first ten years would repay itself within the following ten years, and what is more important, would hold out the possibility thereafter of an expansion of the power programme, doubling every five years for an indefinite period. The fact that most of the established uranium reserves had been discovered during the past few years, coupled with the general geological formations of India, made it probable that the actual uranium reserves were very much greater than those at present known. Until those had been discovered, however, it would be imprudent to plan a power programme, he said.

Dr. Bhaba pointed out that India's total hydro-electric potential was estimated at between 35,000,000 and 40,000,000 kW. and the total coal reserves at about 40,000,000,000 tons. The known reserves of oil in India were very small, and although it seemed likely that new resources would be discovered, they were most unlikely to be of such a magnitude as to change essentially the overall power picture.

It was established that the total reserves of thorium were not less than about 500,000 tons, contained in the monazite deposits on the west coast of South India and to a large extent in the newly discovered deposits of monazite in the Bihar State. Dr. Bhaba said that the first generation of power at atomic stations must clearly be based on natural uranium. Each megawatt of installed electrical capacity from a nuclear power station with an overall efficiency of 26 per cent operating at a load factor of 77 per cent, corresponding to utilization of 280 full days per year, would require an annual feed of one-third of a tonne of uranium on the assumption of a heat extraction of 3,000 megawatt days per tonne. With a load factor of 82 per cent, corresponding to a utilization of 300 full days per annum and an overall efficiency of 25 per cent, the annual uranium feed was 0.4 tonne per megawatt.

Thus, on the assumption that the life of an atomic power station was twenty years, each megawatt of installed electrical capacity would, therefore, require between 6,700 and 8,000 tonnes of uranium spread over a period of twenty years.

The uranium metal plant set up at the Atomic Energy Establishment at Trombay, near Bombay, is the first plant to produce in Asia nuclear grade uranium. Dr. Rajendra Prasad, President of India, told Parliament that the first

ingot of automatically pure uranium metal was produced at the plant on January 30. Designed and built entirely by Indian scientists and engineers, the plant was completed in just under one year after the finalization of the project.

Indeed, the four-year-old thorium plant now produces two much-needed raw materials for atomic energy development. These are over 300 tons of thorium and a few tons of uranium a year, which is equivalent in fuel value to roughly 1,000,000,000 tons of coal. This is about thirty times the present annual production of coal in India.

Our correspondent points out that the plant was built entirely by Indian scientists and engineers. Its capacity was increased six-fold last year, and the plant is one of the largest in the world for the production of thorium nitrate. Besides supplying virtually the entire requirements of the gas-mantle industry in Asia, it also supplies markets in Europe and America. A part of the production of the plant is also stockpiled according to a planned programme for India's future atomic energy needs.

A uranium plant has also been set up to process uranium concentrates into reactor-grade uranium metal for experimental purposes and for use in the reactors that are under construction. Uranium is the basic material for making the country self-sufficient in any atomic energy programme. It has also provided the necessary experience for the design and construction of the large uranium plants which will be required for a full-scale atomic power programme.

The Indian Atomic Energy Establishment is now producing almost all the instruments and electronic components needed for nuclear energy work, and is making radio-isotopes for use in medicine, agriculture, industry, and research work at universities. The Establishment has completed two years of service as the Indian centre for research and development work in the field of atomic energy. It was formally inaugurated by the Prime Minister, Mr. Nehru, on January 20, 1957, and over 800 Indian scientists and technical personnel are now working at the Establishment, situated on a 2,400-acre block of land about 12 miles from Bombay.

Aspara, the first reactor to go into operation in Asia, outside Russia, started functioning in the Establishment on August 4, 1956. This small-sized reactor, which cost Rs.3,500,000, was built in one year after finalization of the design.

The second reactor, Zorlina, will go into operation during the middle of this year. India's third reactor will be the Canada-India reactor now under construction at a cost of Rs.75,000,000 at Trombay. When this reactor goes into operation next year, India will possess one of the best isotope producers in the world. The reactor will require some 20 tons of heavy water, which has been sold to India by the U.S. Atomic Energy Commission.

PYRITE UTILIZATION IN AUSTRALIA

An important and immediate factor in the utilization of pyrite for acid making in Australia is the view that will be adopted by the Tariff Board in the encouragement of pyrite producing companies under the Sulphuric Acid Bounty Act. Australia has a large pyrite producing potential, but these companies suffer heavily from imported brimstone, from which more than 50 per cent of Australian sulphuric acid is made.

After supplying requirements of the proposed ammonium sulphate works, Mount Morgan would have a substantial tonnage available for the acid industry; other producers of pyrite are Lake George Mines, Mount Lyell Mining and Railway Co., where the concentrate is produced as a by-product in copper ore concentration, and Nairne Pyrites Ltd., and Norseman Gold Mines, which are essentially pyrite producers. Norseman Gold Mines is feeling the competition from brimstone severely, and if the Western Australian Government withdraws its freight concession from Norseman to Fremantle, it may be necessary for the company to abandon the enterprise.

A decision by the Tariff Board favourable to encouraging the use of indigenous sulphur-bearing minerals would be of great importance to a number of Australian mining companies, whose production potential exceeds the local market for pyrite.

WATER DEMINERALIZATION RESEARCH

South Africa has moved into the forefront in the world search for a cheap method of sweetening salt water, according to officials of the Council for Scientific and Industrial Research in Pretoria. A pilot plant will soon be erected at Luderitz Bay, in South West Africa, where research will be intensified. Scientists are confident that the operational cost can be lowered.

Meanwhile, the world's first large-scale plant for desalting brack water is nearing completion near Welkom on the O.F.S. goldfields. This plant, which will employ an electrodialysis process developed by the C.S.I.R. in collaboration with the Anglo American Corporation, will produce 2,500,000 gals. of fresh water daily from brack water pumped up from the mines. The cost will be 2s. 6d. per 1,000 gals.

Until now the Free State gold mines have had to pump underground brack water into large evaporation lakes. The Welkom plant, when it is completed, should be able to produce demineralized water suitable for domestic and process purposes on the mines. The cost will be the same as that of the present fresh water supply for the mines, together with that of disposing of underground water.

The magnitude of the installation may be judged by the fact that the next largest electrodialysis plant in the world is one on the Persian Gulf which produces 75,000 gals. of fresh water a day.

RECORD OUTPUT OF COAL IN NIGERIA

The total output of all the mines operated by the Nigerian Coal Corporation in the last financial year was 846,527 tons, representing an increase of 56,497 tons over the previous year's output and the highest output on record. The total cost of the year's working was £2,040,624. The increased output enables certain increases in production costs to be absorbed, with a resulting net surplus of £57,471 which is only £152 lower than that of the previous year. Expenditure for the year, including expenditure on the development of the new Ekulu mine, totalled £183,798.

Statistics show that 374,477 tons of coal were produced at Obwetti Mine, a decrease of 30,218 tons compared with the previous year. The Iva Mine produced 280,942 tons—an increase of 29,939 tons, while the output of Hayes Mine was 169,925 tons—an increase of 36,178 tons over the output previously recorded.

Towards the end of the year, a small area of coal containing approximately 260,000 tons was developed in the Ekulu No. 2 area, and it is planned to extract the whole of this tonnage within the next two and a half years. This will maintain and increase the total output of coal from the mines until the main Ekulu mine goes into full production.

Mineral Exploration in Burma

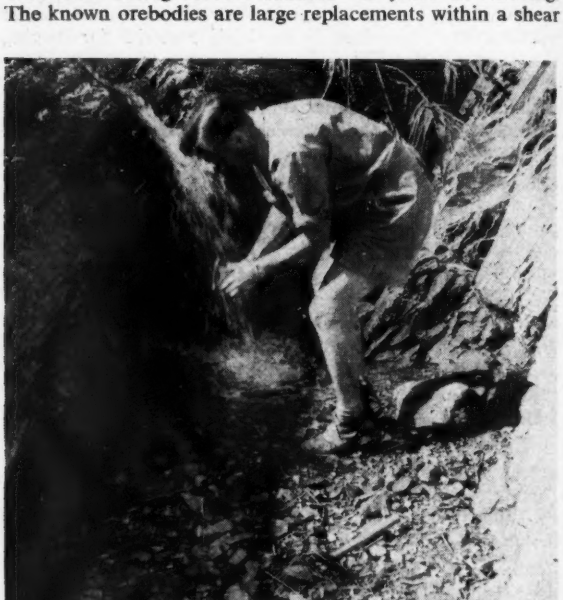
Hunting Technical Services Ltd. have recently carried out a mineral exploration programme in north-central Burma on behalf of the Burma Corporation (1951) Ltd. The ultimate object of the survey is a search for economic ore within an area of approximately 800 sq. miles. This was selected by the Burma Corporation as being the most favourable area for mineralization in the country surrounding the present mine which has been one of the world's major lead/zinc producers.

THE survey entailed a detailed prospecting programme of a small area around the mine and a more general reconnaissance survey of a much larger jungle-covered area underlain mainly by rocks of pre-Cambrian-Silurian age.

The area is fairly near to the Chinese border, and the Chinese occupied and worked the area around the present mine up to the latter part of the nineteenth century. They also carried out much prospecting, as evidenced by the large number of adits and prospecting shafts near faults and in other likely areas. They carried out comparatively large-scale smelting mainly to extract silver from the ore, and this has resulted in metal contamination of soil and streams both in the vicinity of the mine and in areas surprisingly remote from it.

All things considered, therefore, it was apparent that any worth-while orebody in the area would probably be "blind", and the prospecting programme was planned with this in mind.

The country around the mine is rugged, but has been deforested during several hundreds of years of smelting. The known orebodies are large replacements within a shear



zone. The hanging wall is of felspathic grits and the footwall of rhyolite lavas and tuffs, all of early Paleozoic age. There are zones of solid sulphide composed mainly of argentiferous galena and zincblende. The township stands on the plateau limestone and the smelter stack on the older sediments.

Detailed Base Maps

Detailed base maps necessary for work of this nature were constructed by photogrammetric means (by Hunting Aerosurveys Ltd.) from aerial photographs taken specially for this purpose. By setting up a photographic laboratory at the operating base, it was possible to provide the field teams with copies of the photographs and stick-down mosaics a few days after the completion of flying.

The prime purpose of investigations in the exploration area was to pick out areas which would merit a more detailed study similar to that being done in the 10 square miles around the present mine.

At top left, on opposite page, is the Namtu smelter in Burma. Also on the opposite page, at centre left, a geologist collects one of a pair of sediment samples. Below is seen typical jungle-covered Pre-Cambrian sediments in the exploration area

First, a photo-geological study of the area was undertaken. This gave a general idea of the geology, the areas of probable interest and complexity were picked out, and the accessibility of the region was also studied.

After a reconnaissance field trip, it was decided that the geological ground-control work would be carried out at the same time as a systematic geochemical sampling of stream sediments. From the reconnaissance geological survey, a great deal of structural and lithological information was obtained, and since the known ore is structurally and lithologically controlled, such information has proved most valuable in selecting areas for more detailed investigation. Naturally, such mineralization as cropped out was examined in the field, but the analysis of stream sediments was planned as the main prospecting tool in this area.

There are seasonal variations in the metal concentrations of water. This is especially so in monsoon climates, where often there is a sharp increase in the metal content of the water in a stream at the onset of the monsoon due to the rapid flushing out of oxidation zones exposed by the fall in the water table during the dry season. Normally, exchangeable metals of the stream sediments will tend to come into equilibrium with the dissolved metal of the stream waters, but metal concentrations in sediments do not fluctuate as rapidly as those in the water itself.

Survey of Stream Sediments

Therefore, bearing in mind that the area is drained by a multiplicity of perennial streams, it was proposed that a geochemical drainage survey of stream sediments would be the best prospecting method. No complete drainage orientation survey was possible in this area.

Systematic sampling of active stream sediments taking duplicate pairs of samples 30 to 50 ft. apart at ¼-mile intervals was carried out. The finest grained sediment available was collected, but care was taken to avoid organic material and locally collapsed bank soil.

Each pair of samples was analysed for total lead and also for cold extractable zinc in order to cover the possibility of stream sediment anomalies due (*a*) to erosion of a lead soil anomaly with no accompanying zinc (as occurs in the Concession Area), and (*b*) anomalies due to absorption of the more soluble zinc from oxidizing deposits which for one reason or another might not be contributing lead to the local surface drainage. Some 3,000 duplicate samples were collected.

Detailed Sub-Surface Prospecting

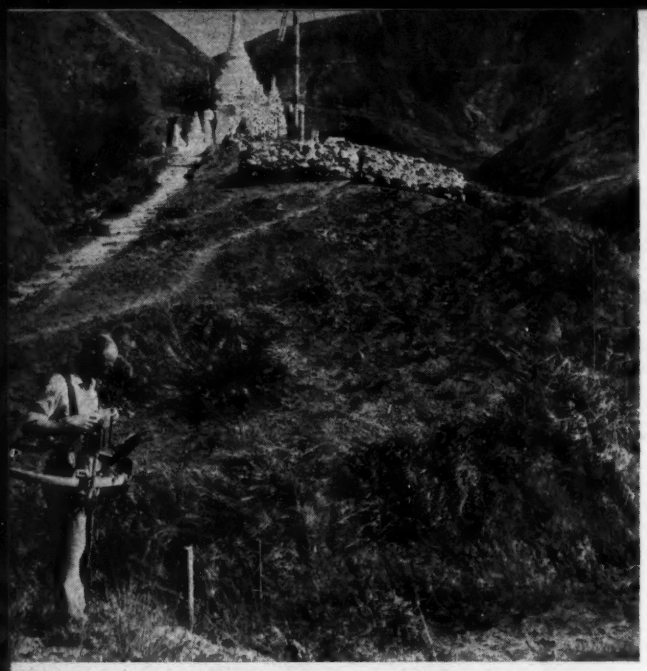
Having assessed background metal concentrations (median of all values in selected area) and threshold (arbitrary determinations), the results were grouped according to the multiple of the threshold values. In the small area around the mine, where thorough geological work had already been carried out, a detailed sub-surface prospecting was carried out using geochemical and geophysical methods.

As previously mentioned, any ore is likely to be subsurface. Therefore, the geophysical equipment used perforce had to have a reasonable depth penetration and be robust and easily portable. These considerations led to the choice of the Ronka ground electro magnetometer equipment using horizontal coils and Nash and Thompson Tellohm resistivity equipment.

An Askania ground magnetometer was used also in selected areas, as it was thought that there might be sufficient susceptibility contrasts between the various rock types to reveal structural features of help in interpreting the other prospecting data. Experience proved the E.M. equipment to be the most useful exploration tool, and the resistivity equipment was mainly for checking E.M. anomalies.

It has been proved necessary for satisfactory operation of this type of E.M. equipment that the coil separation should be correct to within 2 ft. and that the inclination of both coils should be correct to within 5 deg. A special technique using an Abney level and two clinometers was evolved to ensure these conditions in the topographically difficult survey area. Systematic survey was impossible here because of the topography, and therefore in the first instance traverses were carried along reasonably accessible ridges and spurs. In areas of special interest, however, ropes were used to traverse very steep slopes.

During the resistivity survey, four co-linear equally spaced electrodes were used throughout. In the case of depth probes, the initial separation of adjacent electrodes



Operating the Ronka E.M. equipment in typical Bawdwin country

was 5 ft. and the final separation usually 400 ft. Constant separation traverses were generally run with a separation of 150 ft. " In phase " and " out of phase " electro-magnetic readings were plotted and the disturbing effects of topography, coil inclination, etc., taken into account when assessing the results.

From tests carried out over known ore, it became apparent that in this area the geophysical methods would not give reliable indication of ore at depths greater than 150 to 200 ft. below the surface. Therefore to ensure more complete lateral and vertical cover a complementary geochemical soil-sampling survey was also carried out.

A geochemical laboratory equipped with the small amount of specialized equipment necessary was set up at Bawdwin. This was supervised by an analyst with experience of the analytical techniques. With the help of two or three assistants who had previous laboratory experience at the mine, some 9,000 to 10,000 samples were analysed. Tests were carried out for cold extractable zinc, for total lead, for total copper, and for total zinc. The " cold " test was carried out using dithizone in benzene. This extractant was also used in the total metal tests after fusion and digestion with acid. These tests were developed at the Royal School of Mines, London.

A special field procedure was necessary because initial work proved that samples collected at normal depths were all contaminated. Only ridge and spur and gully sampling was possible. Soil samples were collected from the bottom of pits due to bedrock or a depth of 3 ft., whichever was the shallower. The interval between successive sampling points on a traverse was 50 ft.

All soil samples were analysed for total lead and some for total copper. The background copper and lead content was determined by the analyses of 500 samples from non-mineralized non-contaminated areas. The threshold value was estimated empirically as twice the background value.

A close study of the problems particular to this area allied to the specialized local knowledge of the mine staff allowed a satisfactory exploration programme to be evolved. The use of air photographs for planning and for detailed mapping was of considerable assistance to the programme in the field, and by using a combination of appropriate techniques it was possible to carry out the exploration programme quickly and economically.

Gas-tight Sea

THE problem of how to control the flow of large volumes of gas with practically no residual leakage is of economic and operational importance in many industrial fields; it is, however, of particular interest to the mining industry. Partly this is due to the form of energy production common in coal mining. Here the utilization of the lowest grade unsaleable fuel usually forms the tail-end of production, and thereby constitutes an important factor in the economics of coal mining.

Before the war 3,000 to 4,000 Lancashire boilers steamed in the pitheads of this country, nearly all of them hand-fired. They were used as a kind of " incinerator " for the fines, and at the same time supplied all the heat and power needs of the pits they served. Since the war, a considerable number of these boilers have been replaced by direct electricity supply from the grid; but this policy is now being slowed down, since it robs many mines of an economic way of using their waste fuel. Most of the remaining Lancashire boilers are now mechanically fired, and perhaps half of these are shut down overnight during the " back shift ", with its much smaller load. The heat loss of the boilers during this shut-down shift is very substantial—the equivalent of a loss of thousands of pounds each week.

One of the specific applications of gas-tight sealing in coal mining is to prevent these losses, and many hundreds of gas-tight sealing units are installed in collieries throughout the Coal Board. They also provide the most effective control of excess air during operation, the need for which is particularly great with low-grade coal.

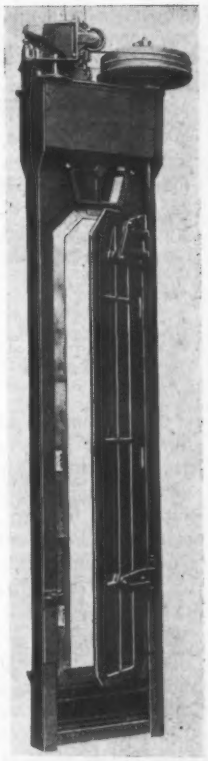
Gas-tight Sealing in the Mining Industry

During the last two years or so, National Coal Board fuel policy has been supplemented by an important innovation, the introduction of water-tube boilers of 60,000 to 100,000 lb./hr. capacity, equipped with Martin stokers for burning slurry and fines with high efficiency. This created further applications for gas-tight sealing—frequently these boilers are installed in sets of two, and their availability is dependent upon the possibility of gas-tight sectionalization. This is provided by a different type of gas-tight sealing equipment.

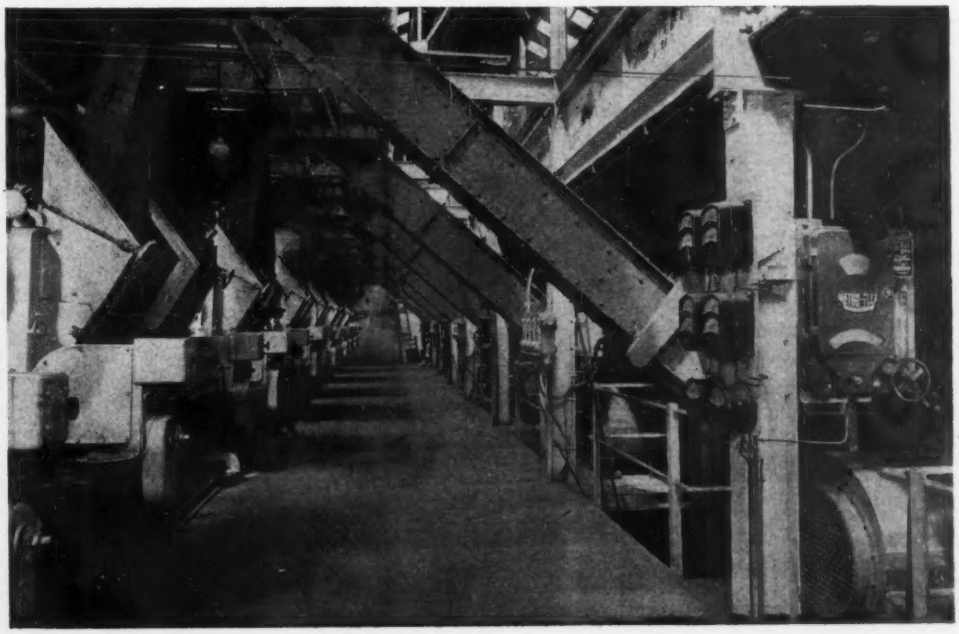
This new development introduces another problem—the need for a stand-by reserve for steam and power in case one of these larger units goes unexpectedly out of service. This stand-by reserve is then required, and required almost at once, not only on economical grounds (i.e. to maintain the production), but also for reasons of safety. It is possible to convert existing Lancashire boilers to steam storage vessels by means of gas-tight sealing equipment similar to that shown in the photograph. Normally, these converted boilers eliminate the economic effects of the sharp low peaks connected with steam winding without entailing the high capital costs for new steam accumulators. But they can be converted, at a moment's notice, into steam-raising plant should sudden outage of the water-tube boiler require the stand-by reserve to come into operation.

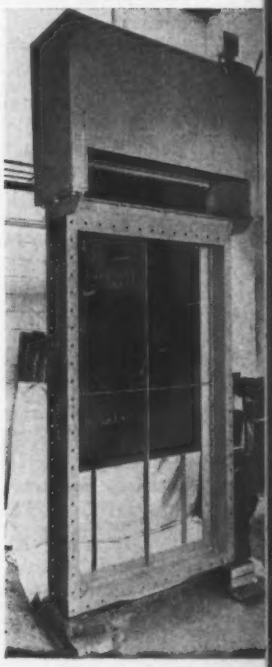
Further thought is now given to the application of gas-tight sealing in yet another field of the mining industry, that is in mine ventilation. The large cross-sectional areas which have to be sealed off, and the great pressure differential which has to be contained, lead to considerable losses due to damper leakage. Moreover, the residual leakage might, under certain conditions, increase the fire risk underground, and therefore there is scope for improved safety by gas-tight sealing. These large-area sealing units are of the coiling curtain type, which is made under the patents to the company concerned.

Gas-tight sealing equipment was introduced in industry more than thirty years ago, but the types described so far are developments introduced after the war under the name of Metro-Flex by the Metropolitan Engineering Co. Ltd.



The illustrations show typical examples of the specific applications of gas-tight sealing in the coal mining industry. At right, above, is one of the two side flue units fitted to a Lancashire boiler. Below, at bottom right, is a gas-tight sealing unit for a National Coal Board water tube boiler. Immediately below are shown Lancashire pithead boilers equipped with draught control and gas-tight sealing, while below, at left, on opposite page, is a control panel, the picture showing draught gauge and CO_2 instrumentation





The Brazilian Tin Industry

COMPANHIA ESTANIFERA DO BRASIL (CESBRA) was founded in 1951 at Volta Redonda, in the State of Rio de Janeiro, to reduce cassiterite and refine tin. The ore obtained by the company from its own mines at Itinga, in Minas Gerais, was supplemented by purchases from other mine-owners. Supplies continued inadequate, however, despite Brazil's numerous mines. In many of these cassiterite is extracted as a by-product of the associated minerals—gold, columbite, wolfram, or tungsten, etc. An attempt to process Bolivian cassiterite, which contains non-commercial quantities of silver, lead, antimony, sulphur, and arsenic, proved a failure, as CESBRA's plant is only equipped to deal with simple ores.

Concentrates had, therefore, to be brought from the East, inflating costs. In 1957, production of tin reached 700 tons, but the output of the local mines amounted to only 255 tons, and over 2,000 tons of cassiterite were imported from Thailand and the Belgian Congo to be processed locally. In addition, 600 tons of tin were acquired in the U.S. and Europe at an average cost of $U.S.2,351 per ton.

Meeting Domestic Requirements

Brazil's consumption of tin rose from 964 tons in 1938 to 2,500 in 1957, equivalent to 3,750 tons of cassiterite, despite exchange restrictions, and the demand will grow rapidly from now on, owing to the development of the automobile industry and the increasing production of tinplate by the National Steelworks. To meet the demand, CESBRA has installed a modern electrolytic refinery, able to process any type of complex ore, including Bolivian cassiterite.

The plant, said to be the third of its kind in existence, is able to produce 6,000 tons of tin annually, sufficient to meet local market demands in ten years' time, and the company claims that losses due to volatilization are only 0.35 per cent, as compared with 5 per cent in the United States. The plant is equipped with a section for the preliminary treatment of concentrates, comprising calibrating mills, electro-magnetic separators, gravity concentrators, and Wedge oil-burning ovens, with electrostatic filters to recover the dust. The ores are then reduced in special electric furnaces and the metal refined by liquation.

For the present, CESBRA will process Bolivian ores, but the company is speeding up work in its own mines at Pau d'Alho, Ponte de Piaui, Monte Belo, and Piaui, all in the Itinga district of Minas Gerais. It is also prospecting for cassiterite in Sao Joao del Rei and Aracuai, where promising occurrences exist, and with the co-operation of the Council of Mines is assisting the owners of small deposits to modernize work. So far, relatively little interest has been shown in extracting cassiterite, but the company and the authorities are convinced that production will increase once a steady market at remunerative prices is assured.

The Director of Inland Revenue, in consultation with the National Department of Mineral Production, has fixed the value of cassiterite at the minehead in 1959 at 35,000 cruzeiros per ton. The c.i.f. price of the concentrates imported from Thailand averaged 113,000 crs. per ton, equivalent to $U.S.1,453.50 in 1957.

According to the engineer, Evaldo Osorio Ferreira, of the National Department of Mineral Production, writing in *Engenharia, Mineracão e Metalurgia* (Rio), tin ores are found in the Licui-Parelhas area of Rio Grande do Norte and Paraiba in highly mineralized pegmatites, associated with tantalite, beryllium, spodumene, ambligonite, columbite, etc. In the Sao Joao del Rei region of Minas Gerais, they exist in pegmatites with spodumene, lepidolite, beryllium, monazite, etc., also in alluvial and eluvial deposits.

In the Amapa Territory, at Mazagao, cassiterite is found with tantalite in altered pegmatites and in alluvial and eluvial deposits. In Rio Grande do Sul, at Cacapava, Piratini, and Encruzilhada, it exists in quartz veins, in association with wolframite, pyrites, etc., and in alluvial and eluvial deposits. It is also found in quartz veins in Sao Paulo, at Mogi das Cruzes, Jundiai, and Sorocaba.

Cassiterite Mines

The following particulars are of cassiterite mines registered with the Department of Mineral Production:

Igarape dos Indios, at Macapa, in the Amapa Territory, measured reserves of 240 tons, licensed in 1953, and reported to mine substantial quantities.

In the State of Paraiba: Serra Branca, district of Pedra Lavrada, exploited since 1946 by Cia. de Mineração Picui, but work now suspended pending result of legal proceedings. The cassiterite is associated with columbite, bismuth, quartz, and beryllium. The Seridozinho mine in Indianapolis, private concession, yielded 22 tons of cassiterite and 2 tons of columbite in 1957.

Minas Gerais has thirty-two registered cassiterite mines, two in Bonsuccesso, in the Sao Tiago district, belonging to Cia. de Estanho Minas Brasil. Four in Itinga, at Pau d'Alho, Piaui, Ponte de Piaui and Monte Belo, all the property of Cia. Estanifera do Brasil; in the two last-named, registered in 1957, cassiterite is associated with columbite. In the Prados region there are seven mines, two at Sao Francisco Xavier, one owned by Empresa Nacional de Estanho, the other by Mineração Vitoria; one at Coroas, the property of Mineração e Fundição Brasil; one at Rezende, registered in 1953 for Mineração Rio das Mortes, and three small mines in the Coroas district worked by private concessionaires. Two small deposits are also exploited by private owners in the Rezende Costa district.

The Sao Joao del Rei region of Minas Gerais comprises nineteen of the State's thirty-nine cassiterite mines, covering an area of over 1,930 square miles. The most important are those of Volta Grande, district of Nazareno, owned by Cia. de Estanho sao Joao del Rei, and Kil. 114-118 in Santa Rita de Rio Abaixo, the property of Teofilo Badin. In three of the mines in this region, cassiterite is associated with gold, namely: Boa Vista, district of Santa Rita, the property of Mineração Boa Vista; Rio Abaixo, in the same district, owned by Mineração del Rei; and one in the Nazareno district, registered for Mineração Rio das Mortes in 1956, which has not yet started production.

Although there are several known deposits in the State of Sao Paulo, there is only one registered mine, the property of Sociedade Sao Paulo de Mineração, at Jurupara, district of Piedade. The cassiterite here is associated with tungsten and iron.

Of six mines in Rio Grande do Sul, one has closed down, the concession having lapsed, and the ownership of another has been transferred to the Federal Union. The Sangra Negra mine, in Encruzilhada do Sul, owned by Cia. Nacional de Mineração e Forca, produces wolfram and cassiterite.

Machinery and Equipment

Protection Equipment for Compressors

Since the 1955 Codes and Rules for Underground Air Compressors were issued by the N.C.B., a great deal of consideration has been given to the protection of compressors against dangerous running conditions. As a result, Teddington Industrial Equipment Ltd. have developed, with the assistance of the N.C.B. and leading compressor manufacturers, a system of comprehensive protection equipment which provides completely automatic supervision for all types of compressor.

This system, which can be applied equally well to reciprocating or rotary plant and can be used for installations both above and below ground, is already installed in a number of collieries in the Midlands and Durham Divisions. It provides advance warning of abnormal running conditions, followed by automatic shut-down before dangerous operation can occur.

The equipment consists of a panel mounted on the compressor and for underground use, a flameproof indicating unit, rotary switch and alarm bell. The panel contains, in addition to the protection switches, all the usual temperature and pressure gauges. A novel feature is the method by which two instruments are coupled together on the same sensing system or pressure union.

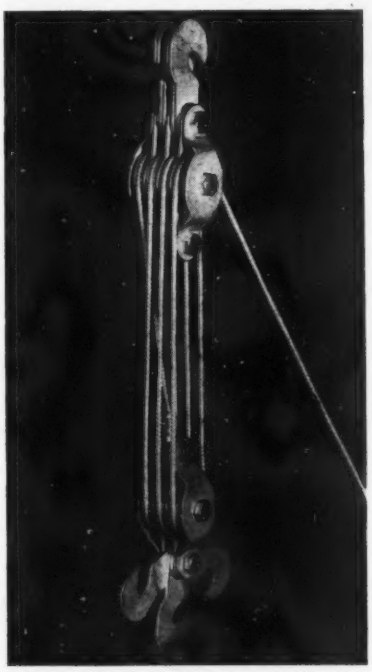
In operation, the motor starter circuit is completed when the rotary switch is turned to the "on" position and provided normal oil pressure has been established within the twenty seconds allowed by the time delay, it will be maintained, thereafter, through the protection switches in the panel and the shut-down relays of the F.I.U. indicator.

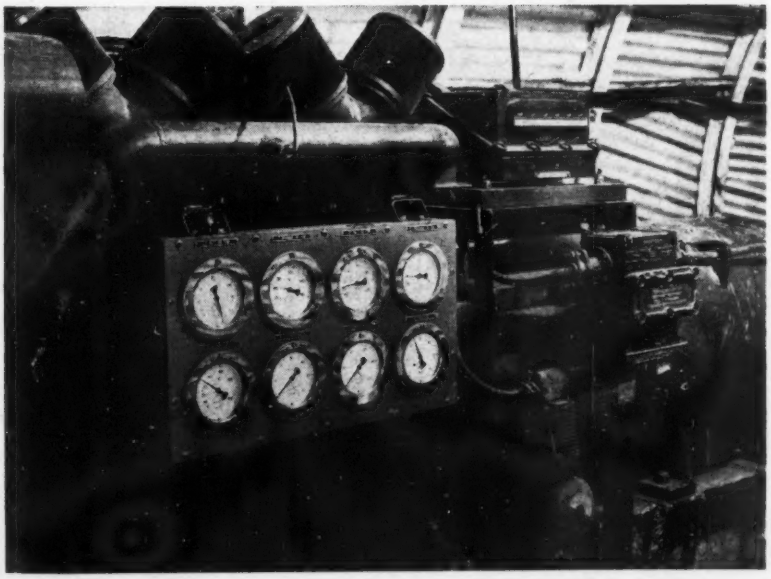
If LP or HP discharge temperatures rise abnormally, the appropriate warning switch will break circuit and the relay with which it is associated will trip out. The relay contacts will close, one pair energizing the alarm bell and the other energizing the associated warning lamp. This provides advance warning of overheating and, if corrective action is taken before conditions deteriorate, the relays will re-set automatically and the alarm will cease. If, however, either temperature rises to danger level, then the shut-down switches will also break circuit and the shut-down relays will trip out.

At top, the Invicta screen of Russell Constructions Ltd.

In centre, the Haltrac midget hoist

Below, Teddington compressor protection equipment at Parkhouse Colliery





A MIDGET HOIST

Haltrac Ltd. present their midget hoist, made of aluminium and combining strength and lightness. It has a 72-ft. rot-proof nylon cord and the latest self-lubricating solid nylon pulley wheels. The entire unit is rustproof. As the load is evenly distributed over the seven strands of nylon cord it produces a combined breaking strength of over 1,200 lb.

The multi-locking hooks are designed to act as a self-locking unit, and can only be opened when the weight is released. The unit has obvious applications in the mining industry.

HIGH-SPEED SIEVING

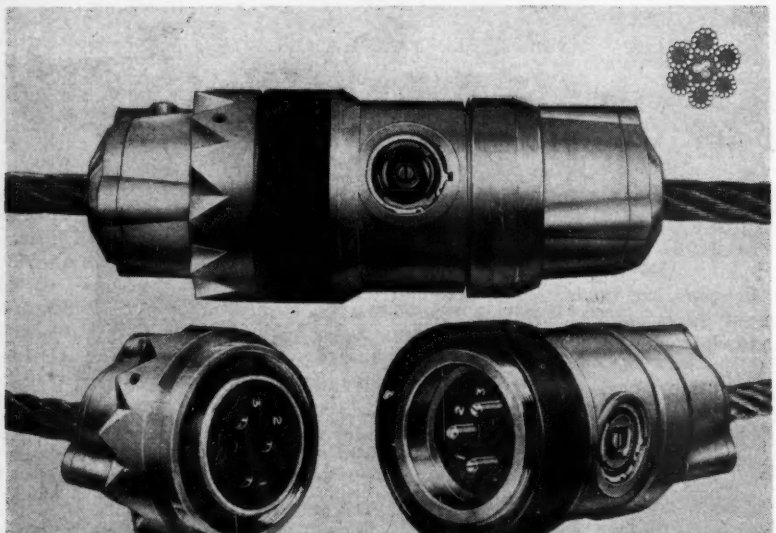
The new Invicta screen, manufactured by Russell Constructions Ltd., is claimed to represent a superior development in high-speed sieving and straining equipment. The Invicta measures 3 ft. across the sieve. Running at 3,000 r.p.m., the machine has outstanding output in the application of both dry sieving and in liquid separation, powders passing the screen at rates approaching 10 tons per hour, and liquids at up to 12,000 gals. per hour.

Parts interchangeability, ease of cleaning and maintenance, silence and reliability are built into this new machine.

FACE SIGNALLING COUPLER

The three-wire face signalling coupler, manufactured by Victor Products (Wallsend) Ltd., has been developed to fill the need for the incorporation of a signalling system within a haulage rope to give signals, and in particular, emergency "stop" signals, from points well within reach of each face worker.

The coupler, which is of the restrained type giving rapid disconnection for moving forward or for replacement purposes in the event of damage, provides for plug and socket connections to each of three



electric cores within the haulage rope and in addition a push-button switch from which signalling can be carried out by connecting two cores together.

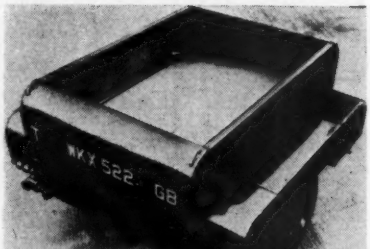
This push-button is provided with a "lock-in" feature so that in an emergency, stoppage of the face equipment may be ensured without continued operation of the push button.

The three-wire circuit permitted by this coupler enables signals to be given at both ends of the face which has normally not been possible with two-wire circuits previously in use.

The coupler operates on any intrinsically safe signalling circuit and can be used in conjunction with audible or visual signals, or to operate the face control panels.

It is suggested that the couplers should be spaced approximately 12/15 ft. apart along the cable or such distance as is considered desirable.

Above is the 3-wire face signalling coupler by Victor, while in centre, below, is the Camel liquid-freight trailer



Below is International Harvester's newest diesel crawler tractor, the TD-15, capable of developing 105 h.p.

A LIQUID-FREIGHT TRAILER

The Camel liquid-freight trailer, manufactured by M. F. Robertshaw Ltd., has met with considerable success abroad and has now been officially approved by the Rover Co. for use with the Landrover and recommended by the Austin Motor Co. for their new "Gipsy".

This two-wheeled trailer, which in its standard form has a capacity of 100 gals. of liquid and 1,500 lb. of freight, is particularly suitable for work over uneven terrain. A new model has been produced which is fitted with shock absorbers, bump rubbers and 360 deg. Auto-Hitch, and these improvements, added to the robust springing, increase its ability to negotiate the roughest ground fully laden with limited risk of structural damage.

The capacity of the various versions of this trailer ranges from 50 gals. and 2,000 lb. to 200 gals. and 500 lb. By special arrangement a double-liquid compartment can be provided in conjunction with the normal freight space, if required.

A number of sales have already been made to Commonwealth and foreign governments and elsewhere in the overseas market where this versatile trailer is in use for petroleum, seismographic and surveying applications. It has obvious applications in the mining industry, particularly during pre-production operations.

NEW DIESEL CRAWLER

Production of a new model diesel crawler tractor, the International TD-15, has just been announced by International Harvester, Chicago.

The 105 h.p. developed by its six-cylinder engine puts the new TD-15 in the big power class, greater than any other medium-size crawler tractor. Features of the engine include positive valve rotators, pressure-lubricated rocker-arm shaft, aluminium alloy pistons, fully counter-balanced crankshaft and twin-plunger IH injection system. Like other International crawler tractor diesels, it has all-weather, push-button, petrol-conversion starting.

Another TD-15, first in the 100 h.p. tractor class, is the new, six-speed, single-stick, full reverse transmission, designed for practical application of all six-speed ranges. A direction control lever permits instant reverse or forward motion without shifting.

HYDRO-TRANSPORT OF COAL

Installations for water transport of coal to the surface have lately been tested in the Debiensko colliery, near Rybnik, in Poland. Water which was formerly pumped out of the workings is led through drainage channels to the reservoir of the hydro-transport pumping station. Coal is transported from the face by a conveyor belt and fed to crushers which crush it to granules of up to 40 mm. The granules are passed into a 250 mm. pipe, 4,500 m. in length which carries them to the shaft. Here, water power is used to raise the coal to the surface, over a distance of 310 m. Output is in the region of 100 t.p.h.

MINING MISCELLANY

Albatros Superfosfaatfabrieken, n.v., of Utrecht, is to found a new company in which Cyprus Mines Corporation of Los Angeles will join. The company will erect at Pernis, near Rotterdam, a large and well-equipped sulphuric acid plant, one of the largest in Europe, and market chemical products.

★

At the National Coal Board's Tower Colliery, Hirwaun, near Aberdare, a tunnel has been advanced 225 ft. in one week. The work was part of the reconstruction scheme, begun early in 1958, which the N.C.B. are carrying out at this colliery, and the contractors responsible for the work are the Cementation Co. Ltd.

★

The first phase of a £12,000,000 sterling manganese ore reduction plant at Cato Ridge, Natal, is nearing completion and is expected to go into production of 120 tons of ferro-manganese a day in June. The plant will draw ore from huge deposits in the Kuruman district, South-West Africa. A big steelworks is contemplated to operate in conjunction with this new industrial enterprise.

★

Radioactive pitchblende discovered in the South Australian Government's uranium mine at Radium Hill is at least ten times richer than any uranium ore so far mined at the field. The discovery was announced by Premier Sir Thomas Playford. It is the first pitchblende to be discovered at Radium Hill, where the complex uranium-bearing ores contain a less rich radioactive mineral, Davidite. Plans are made to explore the new area.

★

A preliminary geologic map of the Lagoa Grande quadrangle, Minas Gerais, Brazil, is available for public inspection at the Library of the U.S. Geological Survey, Washington, D.C., and the Departmento Nacional da Producao Mineral, Belo Horizonte, Brazil. This map is at a scale of 1:20,000 and shows the surface geology of an area of some 180 sq. km., comprising part of the Quadrilatero Ferrifero of the State of Minas Gerais.

★

The Academy of Sciences and the State Planning Committee of the U.S.S.R. will hold a conference on the development of the productive forces of Central Asia next year. It will be attended by several thousand scientists, economists, and industrial and agricultural specialists, and its eleven sections will examine prospects for the development of the ore mining industry, iron and steel, engineering, irrigation and development of desert land. Special attention will be paid to problems of exploiting oil and gas deposits in Uzbekistan and Turkmenia. The conference is expected to be held in Frunze, capital of Kirghizia.

★

The Lending Library unit of D.S.I.R. has started to collect Chinese scientific literature. About 150 Chinese periodicals are now on regular order, and the first batch has arrived at the library's London premises.

★

Sales and purchasing contracts worth more than 700,000,000 marks (approximately $320,000,000) to be concluded with firms from capitalistic countries, have been set as the German Democratic Republic turnover target for the 1959 Leipzig Spring Fair.

★

Rio Tinto-Dow has begun tune-up operations at its thorium recovery plant in the Elliot Lake area of Northern Ontario, Canada. The $1,000,000 plant is the first of its kind designed to recover thorium values from solutions formerly discharged to waste as a result of uranium milling operations.

★

Plans for the construction of a plant to produce ethylene oxide and derivatives in Italy have been announced by Mr. M. G. Dial, chairman of the board of Union Carbide Corporation, United States. The unit will contribute to the expanding activities of S.p.A. Celene, a jointly owned Italian company formed in 1957 by Union Carbide Corporation and Societa Edison of Milan, to produce chemicals and plastics.

★

More than a hundred prospecting groups are going to the Kolyma River basin in north-east Siberia and to the extreme north-eastern edge of Russia this year to look for gold, tin, mercury, and oil. The Kolyma River basin, long the principal Soviet gold-mining centre, is one of the coldest areas in the world.

★

American Zinc, Lead and Smelting Co. has located commercial grades of copper ore in the course of its iron ore drilling programme in Southern Missouri, United States, the firm's annual report has disclosed. Reporting on the drilling, which is being carried on jointly with Granite City Steel Company, Mr. Howard Young, president of American Zinc, declared: "Out of a total of twelve holes completed on approximately 5,000 acres under lease and option, three give promise of commercial grade of copper ore, with thicknesses up to 100 ft." The company is continuing its drilling programme. The drilling is described as slow, with ultimate average depth from 1,900 to 3,000 ft. The two companies have under lease and option 10,672 acres in the south central portion of the State.

★

An orebody containing approximately 20,000,000 tons has been indicated to date at Mattagami Lake Mines Ltd., according to Placer Development Ltd., in Canada. Placer's subsidiary, Canadian Exploration Ltd., along with Noranda Mines Ltd. and McIntyre Porcupine Mines Ltd., each have an equal interest in a two-thirds interest in the Mattagami Lake Mines, which has a property in the Mattagami area of north-western Quebec. Placer says drilling has indicated ore grading about 13 per cent zinc, 0.7 per cent copper, 0.02 oz. of gold, and 1.3 oz. of silver per ton. Drilling is continuing and preliminary engineering studies are being made.

The United States zinc industry will announce details of its recently initiated international research programme, and will discuss marketing problems and plans at the forthcoming forty-first annual meeting of the American Zinc Institute Incorporated, scheduled for April 23 and 24 in Chicago. Major representatives of the zinc industry will discuss current marketing problems arising from consumption-production trends. Speakers will describe recently increased zinc marketing and research efforts aimed at consolidating and expanding present markets, as well as the creation of new ones in the face of intensive competition. Features will include details of the new expanded research programme sponsored jointly by the American Zinc Institute and Lead Industries' Association, as well as use of various marketing techniques for promoting interest in and the selling of zinc.

★

The Netherlands Government has announced the formation of a Foundation for Geological Exploration in Netherlands New Guinea, to pay special attention to "minerals important for nuclear energy". The government also intends to submit to the States-General a mining Bill for New Guinea that will provide freedom of operation for foreign nationals, as required by the European Economic Community Treaty, but reserves the government's right to refuse exploration licences and mining concessions to subjects that themselves practise discrimination in such matters.

★

An old slate mine at Stonesfield, Oxfordshire, closed more than forty years ago, may be reopened shortly by a group of village people. Tiles made from Stonesfield slate, when they are stripped from derelict buildings in the area, bring high prices.

★

The first potash shipment ever made in Canada, consisting of a freight train of thirty-two cars, carrying 1,920 tons of potash, left the loading yards of the Potash Company of America, near Saskatoon, Saskatchewan, recently. The potash was to go to companies in eastern Canada for use as an agricultural fertilizer.

★

Moxey, a Birmingham firm, has been awarded a contract by the South Durham Steel and Iron Company for the manufacture and installation of ore handling and grading plant at its West Hartlepool South works. This plant will handle graded and ungraded ore at the rate of 700 tons per hour from railway wagon tippler to a distribution house. The ore may be conveyed to the screen house, to the 1,000 ft. long stockyard by boom-stacker, or by direct route to blast furnace bunkers.

★

The Western Knapp Engineering Co. has been awarded a contract to develop an underground gypsum mine for the United States Gypsum Co., at Sperry, Iowa, U.S.

PERSONAL

Dr. Henry Cecil Gunning will assume duty as consulting geologist (Rhodesia) in the Salisbury office of the Anglo American Corporation of South Africa Ltd. with effect from April 2, 1959, in succession to Dr. T. D. Guernsey, who is retiring. Dr. Gunning was formerly Dean of Applied Science at the University of British Columbia, Vancouver. After some service with the Geological Survey of Canada, he became a professor at the University in 1939, and was appointed head of the Department of Geology and Geography in 1949, and later Dean. He is the author of numerous government, technical, and scientific publications.

★

Dr. F. Dixey, C.M.G., O.B.E., F.R.S., D.Sc., F.G.S., Hon. M.I.M.M., Geological Adviser and Director of Overseas Geological Surveys, is to retire at the end of June. Dr. S. H. Shaw, O.B.E., Ph.D., M.Sc., F.G.S., M.I.M.M., has been appointed in his place.

★

Mr. G. W. Dunkley, O.B.E., was appointed a director of Westinghouse Brake and Signal Co. Ltd. recently.

CONTRACTS AND TENDERS

India

Design, supply, and erection of a coal-washing plant, including all necessary auxiliary units at Bhojudih (West Bengal). Issuing authority and address to which bids should be sent: Office of the General Manager, Coal Washery Projects, Hindustan Steel Ltd., 2 Fairlie Place, Calcutta. Closing date, June 8, 1959. Ref. E.S.B./6130/59. Telephone inquiries to Chancery 4411, extension 738 or 771.

Cambodia

Construction, mining, and conveying equipment. Terminal delivery date, 29/2/60. Amount, $U.S.300,000. Ref. E.S.B./4868/59/I.C.A. Telephone inquiries to Chancery 4411, extension 354.

Korea

Non-metallic minerals (except petroleum) and non-metallic mineral products. Terminal delivery date, 31/1/60. Amount, $U.S.500,000. Ref. E.S.B./3250/59/I.C.A. Telephone inquiries to Chancery 4411, extension 354.

Laos

Construction, mining, and conveying equipment. Terminal delivery date, 31/12/59. Amount, $U.S.250,000. Ref. E.S.B./3250/59/I.C.A. Telephone inquiries to Chancery 4411, extension 354.

Korea

Aluminium and aluminium base alloys and aluminium products. Amount, $U.S.200,000. Brass and bronze and their products. Amount, $U.S.50,000. Tin and tin-base alloys and their products. Amount, $U.S.100,000. Zinc and zinc-base alloys and zinc products. Amount, $U.S.200,000. Miscellaneous industrial non-ferrous metals and their products. Amount, $U.S.50,000. Terminal delivery date, 31/1/60. Ref. E.S.B./4623/59/I.C.A Telephone inquiries to Chancery 4411, extension 354.

Korea

Construction, mining, and conveying equipment. Terminal delivery date, 31/1/60. Amount, $U.S.200,000. Ref. E.S.B./4623/59/I.C.A. Telephone inquiries to Chancery 4411, extension 354.

Publications Received

The Report on the Mines Department of Sierra Leone for 1957 refers to the two quinquennial periods since the end of the war which have seen a remarkable increase in the value of mineral production. This is shown by the following table:

Period	Value of Mineral Production
1946 - 1950	11,023,362
1951 - 1955	22,465,635
1956 - 1957	18,341,678

There is every reason to suppose that the next quinquennial period, 1956-1960, will show a similar increase.

★

Minerals Year Book, 1957, published in three volumes, provides a record of the performance of American mineral industries during the year. This comprehensive and detailed work is prepared by the staff of the U.S. Bureau of Mines, Division of Minerals. Volume I includes chapters on metal and non-metal mineral commodities. Volume II includes chapters on each mineral *fuel*, and Volume III comprises chapters covering each of the forty-eight States, with extra chapters on the Territories of Alaska and Hawaii.

★

The immense importance of nickel in every branch of industry is aptly illustrated by the abstracts presented in the January issue of the *Nickel Bulletin*. Described as a monthly summary of recent literature, the Bulletin is produced by the Mond Nickel Co. Ltd., and this particular issue, Volume 32, No. 1 also contains the first of the quarterly reviews of recent patent literature.

★

We have received from Vivian, Younger and Bond Ltd. a most interesting and comprehensive chart showing the average prices of copper, lead, zinc, and tin, in London each month during the last twenty years.

★

The new Dolphin floating suction strainer, designed for use with pumps drawing from streams, ponds, or sumps, or employed for de-watering mines, quarries, and excavations, is described fully in a 6-page folder in English, French, and German, just published by Megator Pumps and Compressors Ltd. The Dolphin was discussed in *The Mining Journal* of February 20.

★

We have received from A. Strauss and Co. Ltd. a chart in colour code setting out graphically the main developments in tin during the last few years. Apart from its historic interest, the chart reveals that, if present trends continue, consumption during the coming year will exceed available supplies to an extent that will require the sale of metal from the buffer stock.

★

Preliminary geological maps of the townships of Clergue, Dundonald, Mann, McCart, Newmarket, and Reaume, in the Larder Lake and Porcupine mining divisions, have been prepared by the Ontario Department of Mines from assessment work reports and from company surface and drilling plans. The geology was compiled by Dr. J. Satterly and Dr. S. A. Ferguson, of the Mines Department staff. Uncoloured prints may be obtained on order at a nominal charge from the Publications Office of the Department of Mines, Parliament Buildings, Toronto. Coloured copies of the maps are also available for inspection.

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A handbook for Alaskan prospectors and others interested in the search and location of ore deposits was published recently by the School of Mines at the University of Alaska. *Introductory Prospecting and Mining* was written by Leo Mark Anthony, assistant professor of mining extension. The handbook was originally prepared in lesson form to supplement instruction offered in mining extension courses in prospecting. The bulletin can be obtained through the School of Mines, P.O. Box 498, College, Alaska, at $2.50 per copy.

Guarding for the new Rhondda Main Washery, Ogmore Vale. The machinery —an intricate conveyor system—was built up by the Head Wrightson Colliery Engineering Co. Ltd., who called in Procters to design and construct the guarding. Erection was timed to match the test running of each piece of machinery, and was completed to schedule and is now serving as a fine example of the way the specialist marries design and function

Metals and Minerals

India's Manganese Exports

India's production of manganese ore during 1958 has been estimated at 1,230,000 tonnes by the Indian Bureau of Mines, which (in round figures) compares with 1,628,000 tonnes in 1957 and the peak output of 1,932,000 tonnes in 1953. Orissa remains the largest producer State with a 1958 output of 360,000 tonnes, followed by Bombay State with 310,000 tonnes. Other important producers were Madhya Pradesh with 283,000 tonnes and Mysore with 240,000 tonnes.

India remains the second largest producer and the largest exporter of manganese ore. Last year, however, Indian manganese ore had to face growing competition from Brazilian ore in its largest market, the U.S., while the U.S.S.R. has captured Indian markets in the U.K. and France. According to the Deputy-Minister for Commerce and Industry, Mr. Satischandra, the U.S.S.R. is also making inroads into the American market by supplying large quantities of chrome ore as a substitute for manganese. In January this year it was reported that, due to the depressed condition of the manganese trade and the declining demand for Indian ore, work had been suspended at 26 manganese mines in Madhya Pradesh and Bombay.

In February, 1958, the Indian Government reduced the export duty on manganese ore and in November the export duty on all ore of metal grade was removed. In July, however, royalties were raised from 7½ per cent to 12½ per cent of the f.o.b. value of the ore railed.

Since the announcement nearly two years ago that, from July 1, 1957, an increased share of manganese exports would be canalized through the State Trading Corporation, the outlook for the Indian manganese trade has been further unsettled by uncertainty regarding the government's intentions in regard to this national undertaking.

The Joint Chief Controller of Exports has now issued a statement intended to clarify official policy in the export of manganese ore on a long-term basis. It appears that any order, regardless of size, which a firm (quota-holder or not) is able to secure for shipment before the end of June, 1959, will be channelled through the S.T.C., provided: (1) that the firm, if a quota-holder, satisfies the export trade controller concerned that its quota has been fully booked by firm orders which it has already secured; and (2) that the proposed prices are in reasonable parity with the prevailing world prices, having regard to the grade of ore to be supplied and its impurities. Exporters are advised not to enter into firm commitments until a clearance has been received from the headquarters office of the S.T.C.

As regards long-term bulk contracts, exporters are advised that the assurance regarding facilities for movement and shipment to fulfil their commitment, irrespective of the provisions of future export policy, will be applicable, provided that orders are for a minimum of 5,000 tons to be delivered in one, two or three years after June, 1959, and that prices fixed in the contracts are in reasonable parity with the world prices prevailing at the time.

While welcoming the Indian Government's implicit resolve to discourage price cutting, we cannot help wondering whether, at this critical period, it might not have been wiser to allow greater latitude to private traders as to where and how to sell, bearing in mind that it is to free enterprise that India owes her position as the world's leading exporter of manganese ore.

The Indian Government is at present considering a proposal by the State Trading Corporation to send a trade delegation abroad to recapture India's traditional markets. One of the first requirements, one would imagine, is the creation of more favourable conditions at home in order to encourage exporters and facilitate the movement of ore from mines to port. Is it not by concerning itself with such practical measures as improving rail transport facilities and controlling the grade of exported ores, that the government can most effectively assist the trade?

As for the longer-term outlook, it is noteworthy that, in a paper recently presented to the New York Section of the American Institution of Metallurgical Engineers (*Journal of Metals, December, 1958*), J. M. Warde and E. P. Burke expressed the view that, if steel production reached the levels forecast by 1970, Western demand for manganese ore for metallurgical use could grow to 9,300,000 l.tons of the grade now being used, averaging 46 per cent Mn. This is almost double the 5,200,000 l.tons estimated to have been consumed in 1956.

LONDON METAL AND ORE PRICES, APRIL 2, 1959

METAL PRICES

Aluminium, 99.5%, £180 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £190 per ton
Crude (70%) £190 per ton
Ore (60%) bases 19s. 6d./20s. 6d. nom. per unit, c.i.f.

Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 9s. 0d. lb.
Cerium (99%) net, £16 0s. lb. delivered U.K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt, 14s. lb.
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram.
Gold, 249s. 0½d.
Iridium, £23/£25 oz. nom.
Lanthanum (98/99%) 15s. per gram.
Manganese Metal (96% - 98%) £245/£250
Magnesium, 2s. 3d. lb.
Nickel, 99.5% (home trade) £600 per ton
Osmium, £21/£23 oz. nom.
Osmiridium, nom.
Palladium, £6 10s./£7 10s.
Platinum U.K. and Empire Refined £28 10s. oz. Imported £26/£27
Quicksilver, £77 ex-warehouse
Rhodium, £41/£43 oz
Ruthenium, £18/£20 oz. nom.
Selenium, 50s. 0d. per lb.
Silver, 79½d. f. oz. spot and 79¼d. f'd
Tellurium, 15s./16s. lb.

ORES AND OXIDES

Bismuth		65% 8s. 6d. lb. c.i.f. 18/20% 1s. 3d. lb. c.i.f.
Chrome Ore—		
Rhodesian Metallurgical (semifriable) 48%	(Ratio 3 : 1)	£15 15s. 0d. per ton c.i.f.
„ Hard Lumpy 45%	(Ratio 3 : 1)	£15 10s. 0d. per ton c.i.f.
„ Refractory 40%		£11 0s. 0d. per ton c.i.f.
„ Smalls 44%	(Ratio 3 : 1)	£14 0s. 0d. per ton c.i.f.
Baluchistan 48%	(Ratio 3 : 1)	£11 15s. 0d. per ton f.o.b.
Columbite, 65% combined oxides, high grade		nom.
Fluorspar—		
Acid Grade, Flotated Material		£22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF_2)		156s. 0d. ex works
Lithium Ore—		
Petalite min. 3½% Li_2O		40s. 0d./45s. 0d. per unit f.o.b. Beira
Lepidolite min. 3½% Li_2O		40s. 0d./45s. 0d. per unit f.o.b. Beira
Amblygonite basis 7% Li_2O		£25 0s. per ton f.o.b. Beira
Magnesite, ground calcined		£28 0s./£30 0s. d/d
Magnesite Raw (ground)		£21 0s./£23 0s. d/d
Manganese Ore Indian—		
Europe (46% - 48%) basis 57s. 6d. freight		nom.
Manganese Ore (43% - 45%)		nom.
Manganese Ore (38% - 40%)		nom.
Molybdenite (85%) basis		8s. 11d. per lb. (f.o.b.)
Titanium Ore—		
Rutile 95/97% TiO_2 (prompt delivery)		£31/£33 per ton c.i.f. Aust'n.
Ilmenite 52/54% TiO_2		£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)		84s. 0d./89s. 0d. per unit c.i.f.
Vanadium—		
Fused oxide 95% V_2O_5		8s./8s. 11d. per lb. V_2O_5 c.i.f.
Zircon Sand (Australian) 65 - 66% ZrO_2)		£14 ton c.i.f.

METAL CONSUMPTION DURING THE U.S. RECESSION

United States Bureau of Mines consumption statistics for several important metals have been published in the past few days, and serve to underline the consequences of the recent recession in the American economy and the growing importance in recent years of the more rapid proportional increase in consumption in Western European countries. In this latter connection, the Chase Manhattan Bank has recently issued a report showing that industrial production in the Common Market countries has increased by nearly 45 per cent since 1953 against a 7 per cent increase in the level of United States production.

Aside from lower United States *aluminium* consumption in 1958 (which is referred to in this week's leading note on page 361) and lower *tin* consumption which is reported by our L.M.E. correspondent, the following are the recent year-end figures:

Nickel consumption in the United States in 1958 is estimated at 78,600 s.tons compared with 122,466 s.tons in 1957.

Molybdenum consumption in the United States is estimated at 31,300,000 lb., the lowest total since 1954, and compares with a high point of 42,652,000 lb. in 1956. Although stocks of molybdenum concentrate decreased by 20 per cent during the year to 5,643,000 lb., stocks of molybdenum products at producers' plants had by the end of the year risen by 40 per cent to 8,081,000 lb.

Vanadium consumption in the United States totalled 280,577 lb. in 1958, a decrease of 30 per cent on 1957.

Manganese ore stocks in the United States exceeded 2,000,000 tons at the end of 1958, an increase of 500,000 tons on the year.

Cadmium metal consumption in 1958 is estimated at about 8,000,000 lb. compared with 11,000,000 lb. in 1957. Stocks of metal rose during the year by about 50 per cent to a total of 5,600,000 lb.

Bismuth consumption was down on the year by 30 per cent at 1,128,000 lb. Detailed statistics appear alongside.

U.S. BISMUTH STATISTICS

Bismuth metal consumption in the U.S. increased by nearly 30 per cent in the fourth quarter of 1958, according to the Bureau of Mines, U.S. Department of the Interior. The fourth quarter total of 338,200 lb. brought the preliminary total for the entire year to 1,128,000 lb., or about 30 per cent below that of 1957.

Imports in 1958 totalled 654,000 lb. Peru contributed 74 per cent, Mexico 18 per cent, and Yugoslavia 7 per cent. A small quantity was also received from Canada.

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

The effects of the Easter holidays have not yet completely passed and markets in general have been less active than during the month of March, but in spite of this the upward tendency in the copper price seems to have been re-established, whilst in the other three markets uncertainty rules.

COPPER STRONG

It appears that the speculative liquidation which culminated in Easter week has run its course and the copper market reopened after the holiday with a show of considerable strength. The majority of dealers believe that the price will once more climb to the peak attained about a fortnight ago. This optimism is engendered by a number of statements from the United States that the outlook for the metal is good. Those subscribing to this view include officials of both Kennecott and Anaconda, and also the U.S. Commerce Department.

Against this optimism, however, must be weighed the facts that a large part of the recent buying has undoubtedly been inspired by fear of labour troubles in mid-year, and should these not come about or be of short duration, the period immediately following would be one of slackening demand and falling prices. It has also been reported during the last week that agreement has been reached between the Northern Rhodesian European Mine Workers' Union and the Northern Rhodesian Chamber of Mines on a plan to prevent strikes in the Copperbelt. It is hoped, therefore, that there will be no interruption of production in that part of the world, at least for the coming twelve months.

In the United Kingdom, the stocks of copper in official warehouses have once again increased by 650 tons to a total of 9,866 tons, and it is now no longer expected that shipments will be made from this country to America, as sufficient metal appears to be available here to permit direct shipments to be made from the points of production.

In the United States, the No. 2 scrap price is again rising, with little metal on offer, and at the moment stands at 28 c. per lb. (against a peak of 28½ c. per lb. a fortnight ago). This has enabled customs smelters to maintain a price of 34 c. per lb. The producers' price remains at 31¼ c. per lb., with very little metal available for April and with sales for May delivery proceeding satisfactorily. The improved business outlook is shown in the Copper and Brass Association figures for the consumption of copper by United States brass and wire mills and foundries, which in February totalled 116,565 s.tons against 108,556 s.tons for January. At the same time, unfilled orders with fabricators and orders with producers both showed a respectable increase.

POOR U.S. TIN USAGE IN 1958

No distinctive trend has developed in the tin market, although the contango has been maintained in spite of a further drop of 587 tons to a total of 10,749 tons of metal in official warehouses at the beginning of the week. The commencement of the next quota period, with its additional tonnage of metal free for export, has tended to cause a weak undertone, but to a large extent this has been counteracted by the realization that the amount of free metal available at the moment is extremely small outside the holdings of the buffer stock, the manager of which has shown few signs of being anxious to sell his metal in large tonnages provided the price is in excess of £780 per ton. The reported trouble in Bolivia has not been a great factor in the market, as it appears that a strike is not imminent.

The latest figures issued by the Bureau of Mines cannot make good reading for the tin industry as a whole, as they show that the consumption of the metal in the United States in 1958 declined 13 per cent over the previous year and now stands at 72,000 l.tons. On Thursday morning, the Eastern price was equivalent to £815¼ per ton c.i.f. Europe.

MAKING NONSENSE OF THE LEAD-ZINC CONFERENCE

The lead and zinc markets have been overshadowed by efforts being made in Washington to introduce measures to boost further the lead-zinc mining industries in the United States. The latest Bill to be tabled seeks to stabilize the domestic price of lead at 15½ c. per lb. and of zinc at 13½ c. per lb. Apparently these prices would be established during some particular quarter, and thereafter they would move in accordance with the average price index in the United States. Protection would be in the form of quotas, and these apparently would be varied from quarter to quarter in accordance with United States requirements; the initial basic quota being a percentage of the imports for 1956. There had lately been hope of something concrete coming out of the next U.N. conference on lead and zinc, but in view of the recent political activities in the United States, it would appear that agreement on world-wide cutbacks will be impossible, as it has now been clearly underlined that such action would be almost entirely for the benefit of American high-cost producers. At the same time, if the proposed legislation in the United States should become a fact, it would then probably be forced upon other producers to make some adjustments in output in order to maintain a reasonable price level throughout the rest of the world.

Meanwhile, Washington's present endeavours to bolster lead-zinc prices have not prevented a fall this week of ½ c. in the domestic lead price, which is now down to 11 c. in face of the declining price on world markets. At the same time, prices in London are still tending to go lower, the contango on lead to widen and the backwardation on zinc to disappear, and all three of these tendencies should continue for some weeks to come. Demand for both metals cannot be described as good at the moment, but some of the main consumers in Europe are still not buying after the holiday.

The Bureau of Mines gives the figure for recoverable zinc from mines in the United States during January as 35,200 s.tons, an increase of approximately 10 per cent above the December figure. The corresponding figure for lead is 23,500 s.tons, an increase of 7½ per cent above the December figure. The United States Bureau of Customs reports indicate that, almost without exception, all quotas were filled for the second period of the restrictions imposed last autumn on lead, zinc, and their ores.

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The British Bureau of Non-Ferrous Metal statistics have issued their figures for January, and these show that usage of copper fell to 54,395 l.tons as compared with 56,698 l.tons in December, and stocks rose to 65,941 tons as compared with 64,189 tons a month earlier. It is interesting to note that during January there was a big increase in exports and re-exports, largely due to increases in shipments to the countries behind the Iron Curtain. The offtake of lead increased to 28,872 tons, as compared with 27,287 tons in December, and stocks were 48,102 tons as compared with 45,444 tons at the end of December. January consumption of zinc also showed a slight increase at 27,489 tons as compared with 26,042 tons in December, and stocks at the end of the month showed a very slight increase at 37,733 tons as compared with 37,094 tons a month earlier. The offtake of refined tin was slightly lower at 1,769 tons as compared with 1,802 tons in December, but stocks showed a considerable decrease at 16,744 tons as compared with 19,054 tons at the end of December.

Closing prices are as follows:

	Mar. 25		Apl. 2	
	Buyers	*Sellers*	*Buyers*	*Sellers*
COPPER				
Cash	£247	£247½	£250½	£250½
Three months ..	£246½	£246½	£250½	£250½
Settlement ..	£247½		£250½	
Week's turnover	9,675 tons		7,500 tons	
LEAD				
Current ½ month	£66½	£66½	£67⅞	£68
Three months ..	£68½	£68½	£69¼	£69½
Week's turnover	6,625 tons		6,050 tons	
TIN				
Cash	£773½	£774½	£782	£782½
Three months ..	£778½	£779	£784½	£785
Settlement ..	£774½		£782½	
Week's turnover	935 tons		685 tons	
ZINC				
Current ½ month	£73½	£73½	£71	£71½
Three months ..	£72½	£73	£71	£71½
Week's turnover	7,150 tons		4,825 tons	

Mining Finance

Ashanti Forecasts Maintained Dividend

The main question to which shareholders in Ashanti Goldfields Corporation required an answer at the annual meeting was whether or not they could look forward to maintenance of the 2s. dividend on the capital as increased by the one-for-three free share issue. Major-General Sir Edward L. Spears, the chairman, duly obliged in no uncertain manner. He said that if mining results continued at their present level and nothing unforeseen occurred, it was hoped to pay an interim of 1s. for the year to September 30 next, followed by a final of like amount. This puts Ashanti 4s. shares on a yield basis of over 15 per cent at 13s. 1½d., the ex-share bonus equivalent of the current price of 17s. 6d. Even allowing for the fact that many investors will probably continue to shy away from Ashanti because of their doubts about Ghana's political stability, this looks a very generous return indeed, especially in the light of the general air of optimism in Sir Edward's speech.

The richness of this remarkable gold property is amply illustrated by the disclosures made in the Ayeinm mine, which is separate from the main Ashanti mine. At Ayeinm, between the 11th and 16th levels, development has proved 66,000 tons of ore with an average gold content of 38 dwt., or nearly 2 oz., a ton. In the lower part of the Ashanti mine, to which access has been facilitated by the new Eaton Turner shaft, 242,502 tons have been added to the reserves between the 34th and 41st levels with an average value of 25.4 dwt. Moreover, a borehole yielded values up to 36 dwt. from the 42nd level horizon.

The company's total ore reserves at September 30 last were 1,586,300 tons, averaging 19 dwt. (or nearly 1 oz.) per ton. These are equal to close on four years' supply for the mill at the present crushing rate, but reef development is nevertheless being speeded up in 1958-59 so that a greater footage will be accomplished than last year despite the slowing down that was made necessary in the first part of the period while the winder at the Eaton Turner shaft was out of action. Hoisting at this new shaft was stopped last October and was not resumed until last monh after new drum cheeks had been fitted to the winder. Despite this, Ashanti reckons to produce 313,000 oz. of gold in 1958-59 against 282,530 oz. last year. This means a monthly rate of about 26,500 oz. in the second half of the current period.

Ashanti is still spending plenty of money on its property. Capital expenditure over the next three years was put by General Spears at £1,287,000, which, he said, would be found from depreciation provisions and profit appropriations. In the long view, as the fruits of this expenditure are gathered, Ashanti should thus be in a position, if all goes well, either to pay higher dividends or make still another in the long line of capitalization issues. The issued capital at just under £2,500.000 (£2,497,115 to be precise) will, after the pending issue, still not be unduly large in relation to the mine's earnings potentialities (page 377).

HOPE FOR BIBIANI?

At the meeting of Ashanti's sister company, Bibiani, General Spears was, of course, not able to paint such a glowing picture. He was unable to alter his previous assessment of prospects, namely: that unless development results improved, it would not be possible to maintain the present milling rate beyond October, 1962. Sir Edward went on to say that it would be appreciated that time was now a vital factor, and that the only hope of prolonging the life of the mine lay in energetically exploring the most promising areas.

Is there any hope? Well, at least General Spears was able to detail some encouraging results from the East and West reefs at the northern end of the 18th level. The West reef has given 11.68 dwt. gold per ton over a width of 24.21 ft. for a length of 200 ft. and the East reef 7.59 dwt. over 10 ft. for 95 ft. These Sir Edward said, were the most hopeful results obtained for the past eighteen months and substantial tonnages of good-grade ore were indicated. Development of these ore shoots was continuing, including diamond drilling to see whether they persisted at depth.

Bibiani is still hoping that the Ghana Government's probe into the possibility of resuming aid for the low-grade mines will have a favourable outcome. A Canadian expert, Dr. G. C. Monture, has put forward certain recommendations to the government. As Sir Edward points out, any subsidy on the Canadian model would be helpful. Meanwhile, Bibiani 4s. shares stand at 2s. 6d. to yield 16 per cent on the 10 per cent dividend paid for the year to last September. This return is very little more than that offered by Ashanti! Yet there is no doubt whatever which is the better holding (page 377).

BANCROFT KEEPS ITS DATE

The Bancroft re-opening has gone according to plan. It has been officially announced by this new Northern Rhodesian copper mine that ore from stoping would be fed to the plant on April 1, and that it was anticipated that the tonnage milled would steadily increase so as to achieve the planned output at the annual rate of 50,000 tons of copper later this year. A small tonnage of copper concentrate has already been sent for smelting.

At the same time, the financial arrangements have gone ahead as expected. In other words, short-term loans of £4.500.000 and notes of £3,000.000 have been replaced by an issue at par of 7,500,000 6¼ per cent redeemable participating Preference shares of £1. These have been allocated to the companies which have financed Bancroft. These are Anglo American Corporation, Rhodesian Anglo American, Rhokana and Nchanga.

So Bancroft's capital is now £5,500,000 in 5s. Ordinary shares and £7,500,000 in Preference, plus a long-term loan of £5,000,000. There are also 3,000,000 Ordinary shares under option at 20s. until March 31, 1963, to the same four companies that are taking up the Preference issue. These options are profitable to exercise, the current price of Bancroft Ordinary being 29s. It is generally assumed that the options will be taken up some time during the current year. This would put the company's finances in reasonable shape. But for a 5s. share standing at not far short of six times its par value the propect of worth-while dividends is still very much a long-term proposition. In other words, the fact that the mine is destined eventually to take up its rightful position among the other major Rhodesian producers is already being considerably discounted in the share price.

ARISTON MISGIVINGS

If the directors of Ariston, the Ghana gold producer, had merely been thinking of the share market effects of their dividend decision announced this week, they would probably have created a more favourable impression by giving nothing in the way of a final payment for the year to last September and making the first interim for 1958-9 up to 4½d. instead of the 3d. actually declared. It was the interim rather than the final dividend that seemed to cause some disappointment. It was inevitably compared with the 4½d. interim for 1957-58 which was accompanied by the special payment of 3d. resulting from Overseas Trade Corporation tax savings.

As it is, the 3d. interim seems to have raised some doubts about Ariston's being able to distribute what may be described as a genuine 9d. for the current financial year. In fact, the pre-strike distributions usually took the form of a 3d. interim and a 6d. final payment so that these doubts have little justification. Naturally, stockholders are going to be disappointed if it turns out that the company has not now got itself back on to its former dividend basis that ruled in the 1952-54 period, when the units were as high as 9s. at one time, against the present 4s. 7½d. This gives them a yield on a 9d. dividend of 16 per cent—much on a par with that offered by Ashanti and Bibiani.

Ariston's gross profit for 1957-58 is £32,717 down at £343,148, but largely owing to a tax and duty adjustment, the net figure of £292,269 is £48,102 higher than a year previously. The dividend of 9d. requires £194,063 net. After allocations of £53,716, against £116,625, the carry-forward is raised from £145,386 to £189,876.

AMERICAN METAL SHOWS ITS CONFIDENCE

American Metal Climax, the combination of American Metal and Climax Molybdenum, had the misfortune to start off its first year's operations in a period of lower metal prices and a reduced volume of molybdenum sales owing to America's lower steel production. Fortunately for shareholders, this experience is now past history. To use the exact words of the 1958 annual report now published, "in recent months, however, business conditions and our earnings have evidenced an upturn".

American Metal is of chief interest to the London share market through its control of Rhodesian Selection Trust in which a 50.61 per cent interest is held.

As a result, American Metal also indirectly controls two Rhodesian copper producers, Mufulira and Chibuluma. It has a direct 32.65 per cent interest in the other producing member of the R.S.T. group, Roan Antelope. All these companies end their financial years on June 30. American Metal will thus have borne the full brunt of the sharply reduced dividends for 1957-58 in its own earnings for the year to December 31 last. In 1959, the company is almost certain to obtain an increased revenue from this particular source. The first indications will come from the R.S.T. group interims next month.

American Metal showed its confidence in the buoyancy of its future income by maintaining the distribution for 1958 at $1.20 per Common share out of net income that was only $1.27 per share against $1.95 in 1957. In other words, dividends absorbed almost all the net earnings instead of only 60 per cent of combined earnings in 1957. Over the past decade, it is stated that dividends paid by the two companies have averaged 56 per cent of the combined profits.

The current year's income of American Metal will include profits of $1,348,000 accruing from the sale of the company's interest in British Aluminium and $2,082,000 from the disposal of the remaining holding in Consolidated Coppermines Corporation. These figures are before taking into account the capital gains tax which this sale attracts.

JUMP IN BRAND PROFITS

- Outstanding in the March returns from the South African gold mines was the big jump to a new high record in the profits of President Brand, the Orange Free State producer. The surplus of close on £700,000 had the effect of underlining the company's ability to hold its 5s., or 100 per cent, dividend rate despite the increasing impact of taxation, which may now be taking something in the region of 50 per cent of earnings. At 66s. 3d. ex dividend, Brand offer a yield of 7.5 per cent before allowing for double tax relief which will now be playing an increasing part in raising the actual return for United Kingdom shareholders.

BETTER HARMONY DIVIDEND

The end of the half-yearly dividend season of the O.F.S. gold mines was celebrated by a further increase in the distribution by Harmony, Central Mining's property in the south of the Free State goldfields. Harmony's dividend is 1s. 1½d., making a total for 1958-1959 of 2s. 1½d. compared with 1s. 9d. in 1957-1958 and 1s. in the year to June 30, 1957, when dividend payments began.

Mazapil's Railway in Trouble.—A statement from the Mazapil Copper Co. says that increases in labour and fuel costs and other adverse factors have resulted in a further deterioration in the affairs of its railway subsidiary, Ferrocarril de Coahuila y Zacatecas. The railway company has had no option but to lodge a petition for bankruptcy in the Mexican Courts. The investment must now be regarded as of little value, but in the 1957 accounts the contingency reserve was increased to a figure roughly equivalent to the book value of the railway company. Arrangements have been made for a road haulage between the mine and the nearest National Railway station in the event of a cessation of services on the Coahuila railway.

LONDON MARKET HIGHLIGHTS

On the Tuesday after Easter the South African gold share markets in London and at the Cape reopened to find that the effervescent Free State Geduld had been fairly strongly bought by U.S. buyers over the holiday. The result was that F.S.G. spurted 10s to close the day at a new peak of 185s. Despite renewed talk that these shares will reach £10 in the next month or two, there was no follow-through to the movement on Wednesday when the shares at their ex-dividend price of 180s. 7½d. were 2s. 4½d. down on balance. Blyvoor, however, held their rise at 27s. 7½d., a move that was also believed to have followed American demand.

The running was taken over by President Brand which advanced strongly to 66s. 3d. xd. Again, U.S. buying was held responsible for the movement, but it did not pass unnoticed that the mine's March profit — announced that evening — had bounded to a record £697,748. There were many other sharp advances in profits during March, most of them resulting from the increased tonnages worked. Particularly welcome was the improvement in the young Winkelhaak mine's earnings after what had been considered a rather disappointing start in December. Elsewhere, New Wits (9s. 9d.) were unmoved by news of the proposal to take over Middlevlei (2s. 3d.) on a one-for-four share exchange basis. The gyrations in Loraine continued and, after dropping to 30s., the shares rebounded to 31s. 4½d.

In the finance company section both Union Corporation and General Mining were firm features. The former closed at 54s. 3d. and the latter at 130s.

Firmest spot among the other gold shares was Ashanti Goldfields which put on 7½d. to 18s. 1½d. This followed the chairman's forecast that, barring any unforeseen happenings, it would be possible in the current year to maintain the 2s. dividend on the capital increased by the one-for-three scrip issue.

Copper shares were subdued to some extent by the dullness of Wall Street, but later began to pick up again on the sustained firmness of the metal price. Chartered recovered to 83s. 9d. and Nchanga were soon ⅛ better at 10⅞. The market welcomed the news of Bancroft's return to production by lifting the shares 6d. to 28s. 10½d.; but there was an undercurrent of caution about future earnings prospects in the light of the mine's heavy capital structure. Rhodesia-Katanga eased to 17s. 9d. on some selling against options, but the speculative possibilities bound up in the hoped-for reopening of the property soon brought in some support at the cheaper prices.

Buyers of Lead-zincs could hardly have been expected to show much enthusiasm in face of the depressing level of the respective metal prices. But share prices held up remarkably well. Consolidated Zinc hardened to 61s. 3d. and others lost little ground.

Once again the Tin share market showed little movement either way, but would-be buyers found that stock was hard to come by. Meanwhile, the metal price showed considerable firmness in creeping up past the buffer stock manager's permitted selling price of £780 a ton—at a time when the new sales quota period with its increased allocations was commencing. Mawchi were notably firm at 2s. 1½d. following the announcement about the company becoming a holding concern. This was taken by some to indicate that a new line of business for Mawchi was in the offing and at their low price the shares appeared to be a reasonable speculation.

FALCON MINES

The Forty-ninth Annual General Meeting of Falcon Mines, Limited was held on March 31, at Bulawayo.

Mr. F. L. Wigley, Chairman, presiding, said :—The Directors' Report and Accounts together with my Review of the Company's activities, which have been in your hands for some time, give full details of the operations of your Company for the year ended September 30, 1958, and I now propose to give you a brief account of the work done and the results obtained since the close of the financial year.

The tonnage milled at the Dalny Mine for the five months ended February 28, 1959, was 99,800 tons, which yielded 18,521 ounces fine of gold, equal to a recovery of 3.71 dwts. per ton milled. The working profit at the mine for that period, based on a selling price of gold of 245/6d. per ounce was £58,654. In addition, £2,697 accrued from sales of gold at prices above 245/6d. per ounce in respect of gold produced during the three months ended December 31, 1958.

Development values during the same period have been better than average. The total footage advanced was 3,942 of which 2,065 feet were sampled and 875 feet, equal to 42%, were payable, averaging 6.6 dwts. per ton over a width of 69 inches.

In the Pixie area, a drive east towards the borehole intersection has been commenced from the Dalny 7th level crosscut but no payable values have yet been encountered. The Pixie shaft has reached a depth of 170 feet.

At the Sunace and Bay Horse Mines the estimated working losses for the five months were £13 and £178 respectively.

The working profit for the three mines for the period was thus £61,160, excluding additional revenue which will accrue from the sales of gold at prices in excess of 245/6d. per ounce for the months of January and February, 1959.

Regarding the electricity tariff, the Electricity Council is still hearing evidence on the case submitted to it and the proposed increase has not yet become effective.

On March 11, Dividend No. 11 of 4½d. per share, equivalent to 7½%, was declared payable to Shareholders registered on March 31, 1959. This is the same as declared in March, 1958. Dividend warrants will be posted on or about May 8.

The Report and Accounts were adopted.

ASHANTI GOLDFIELDS CORPORATION

PREVIOUS TONNAGE AND OUTPUT RECORDS SURPASSED

MINE'S MAJOR CONTRIBUTION TO GHANA'S ECONOMY

MAJ.-GEN. SIR EDWARD SPEARS ON PROGRESS IN AFRICANIZATION

The 62nd annual general meeting of Ashanti Goldfields Corporation Limited was held on April 1 at the Chartered Insurance Institute, 20, Aldermanbury, London, E.C.

Major-General Sir Edward L. Spears, Bart., K.B.E., C.B., M.C., F.Inst.D. (Chairman and Managing Director) presided and, in the course of his speech, said :

Tonnage mined and gold output have exceeded the figures achieved last year and established a new all-time record.

Planned gold output for the current year is 313,000 ounces.

Development results continue to be excellent.

During my annual visit to the mine in January and February of this year, I was extremely pleased to observe the progress made in Africanization, and the happy relations between management and labour at all levels. Altogether, both as regards results and prospects, we have every reason for satisfaction.

You will have seen from the notice of this meeting that we are proposing to increase the capital of the Corporation to £2,500,000 and by capitalizing Reserves to issue shares to the value of £624,279, at the rate of one for every three ordinary shares held.

If mining results continue at their present level and nothing unforeseen occurs, we hope that profits will enable us to pay an interim dividend of 1/- per share on the enlarged capital, and to recommend a final dividend of the same amount in respect of the year to September 30, 1959.

The profit for the year after charging Ghana Minerals Duty but before Income Tax was £1,314,378. Out of this we have to provide £545,164 for Income Tax, leaving £769,214. Adding £227,067 written back from provisions for Tax and Minerals Duty in past years we have £996,281 available in the year under review.

An Interim Dividend of 1/-d per Share was paid in September, 1958, and we now propose a Final Dividend of the same amount, 1/-d per Share. These two payments will take £538,440. In addition we propose a Cash Bonus of -/6d per Share. This will take £134,610 so that the total distributions for the year will be £673,050. This is the highest amount paid to Shareholders in the last 19 years. The cash bonus is, of course, a once for all payment which we are able to make because of relief given to us as an Overseas Trade Corporation. We are transferring £100,000 to Fixed Assets Replacement Reserve and £70,000 to Prospecting, leaving £153,231 to add to the balance carried forward.

Production

Production in the year under review was £365,198 tons milled, yielding 282,530 ounces of gold. This is 26,471 tons and 7,313 ounces more than last year's record figures.

For the first six months of the current year 201,000 tons have been milled for a gold recovery of 154,050 ounces. The figures for the corresponding period last year were 174,000 tons milled and 135,000 ounces of gold. In the second half year, we expect to produce approximately 26,500 ounces a month.

Ore Reserves

The ore reserves were recalculated at September 30, 1958, and are given in the Consulting Engineer's Report at 1,586,300 tons of an average grade of 19.0 dwts per ton. This compares with 1,449,984 tons averaging 19.1 dwts per ton in 1957. Tonnage has increased by 136,316 tons, but average grade has decreased by 0.1 dwts/ton.

The programme of development planned for the year under review was largely fulfilled and excellent results were obtained. Total development footage, including stope preparation, amounted to 43,537 feet, which is 10,273 feet more than last year.

I should like to emphasize that the increased gold output which we are now obtaining, and which we have every hope of increasing further, is not being obtained at the neglect of development. On the contrary, we have no intention of pursuing other than a sound mining policy which will make the best possible use of the present and future resources of the mine.

A Great National Asset to Ghana

As I have said on previous occasions, Ashanti Mine is a great national asset to Ghana, and it is our duty to work it not only in the interest of shareholders but in that of the people of Ghana as well.

It is making, in taxation, wages, stores, services and skills, a major contribution to the economy of the country. Our plans must have as their objective that the mine shall have as long and increasingly productive a life as its resources allow.

Chairman's Visit to Mines

I spent six weeks on the Mines in January and February. My impression of my visit to the property was excellent, better than any in my experience. The European staff are keen, hard working and efficient, tremendously proud of the records achieved and determined to surpass them. The African employees at all levels are more settled and contented than I have ever known them. I received personally at my house at Obuasi every member of the senior African staff.

Progress since my last visit has been remarkable.

It is our aim and object to continue long in Ghana an association which has been so fruitful in benefits to the Country and to the Corporation.

That there will be difficulties none can doubt, but if things go on as they are and nothing occurs to lead to a change of policy, which I do not believe will be the case, we can look forward to many years of successful co-operation.

The report and accounts were adopted.

The proposed increase of capital and scrip issue having been approved, the proceedings terminated.

BIBIANI (1927) LIMITED

TONNAGE MILLED A NEW RECORD

The 32nd annual general meeting of Bibiani (1927) Limited was held on April 1 in London.

Major-General Sir Edward L. Spears, Bart., K.B.E., C.B., M.C., F.Inst.D. (Chairman and Managing Director) presided and, in the course of his speech, said : Tonnage milled, 403,787 tons, is a new record for the Mine, and gold recovered, 82,650 ounces, is 4,658 ounces higher than last year. Bullion sales, at £1,038,018, realized £54,000 more than last year, but mining costs were higher by £91,000 due to increases in cost of stores and African wages. Further, the Government grant ceased in June, 1958, the amount received being £18,225, against £29,555 in 1957.

Profit before tax was £78,523, £26,200 less than last year. Tax as an Overseas Trade Corporation, was £33,528 as against £40,400 in 1957, leaving a net profit of £44,995. The Interim Dividend of 2.4d per share and the Final Dividend of the same amount now proposed require £28,750 and £1,247 is required for Prospecting, leaving £14,998 from the year's net profits.

Our liquid position remains sound. Cash balances and securities—all short term—total £368,000, an increase of £68,000 over the previous year.

Bibiani Mine is working on a very narrow profit margin and the large amounts we are spending on development are a heavy drain. The ending of the Government subsidy, although in the meanwhile there has been an increase in African wages, has still further strained our resources.

I was therefore particularly glad to read the announcement made by The Minister of Finance, Mr. Gbedemah, on December 17 last, that it was the policy of his Government to do everything possible to establish the mining industry firmly and to that end to continue to give assistance to those mines which are in difficulties.

Since the subsidy ended, a review of the mining industry has been made by Dr. G. C. Monture, Administrator of the Canadian Gold Mining Assistance Act, at the request of the Ghana Government. I understand that his recommendations are being studied by the Government, and we shall be greatly interested to learn the result.

For the first six months of the current year 205,000 tons have been milled for a gold recovery of 43,200 ounces. The figures for the corresponding period last year were 204,000 tons and 41,300 ounces of gold. It is planned to maintain production at its present level for the remainder of the year.

Last year I drew attention to the fact that development was not exposing sufficient new ore to replace the tonnage mined each year and that, unless results improved, it would not be possible to maintain the present milling rate beyond October, 1962. Unfortunately, I am unable, this year to change my previous assessment. Results obtained from exploratory development were, on the whole, disappointing.

It will be appreciated that time is now a vital factor and the only hope of prolonging the life of the mine lies in energetically exploring the most promising areas. This policy is being followed and has already given encouraging results.

The report was adopted.

Coming Events

An authoritative new course is to be offered by the Metals Engineering Institute, a division of the American Society for Metals. It is called "Iron Blast Furnace Operations". Details may be had from Metals Engineering Institute, Dept. NR-3, American Society for Metals, 7301 Euclid Avenue, Cleveland 3, Ohio, U.S.A.

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Arrangements for the Seventh Commonwealth Mining and Metallurgical Congress, to be held in 1961, are already under way in South Africa and the Rhodesias. A meeting in Salisbury under the chairmanship of Sir Ronald Prain discussed the arrangements in the three countries. In the timetable under consideration, activity begins in Johannesburg at mid-April, 1961, and after four weeks in South Africa delegates will fly to Northern Rhodesia, finishing in Southern Rhodesia at the end of May. Further details will be published when released by the Congress Executive Council.

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Mr. W. Railston, M.Sc., Ph.D., F.Inst.P., scientific adviser, Colombo Plan, will deliver the Henry Morley lecture at the Royal Society of Arts, John Adam Street, Adelphi, London, W.C.2, on Thursday, April 16, 1959, at 5.15 p.m. His subject will be "Britain and the Technical Development of Eastern Commonwealth Countries Under the Colombo Plan".

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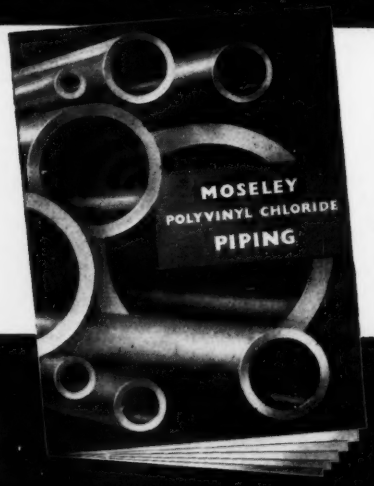

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